

Algebra 2 5.0
Review - Chapter 5

Name _____
Date _____ Pd. _____

Section 5.1 - Is the following quadratic or not? If so write in standard form.

1. $f(x) = 2x(x+5)$

2. $f(x) = x^2 - x^2(x+7)$

Yes or No Yes

Yes or No No

Std. Form $2x^2 + 10x$

Std. Form _____

Section 5.2 - Solve each equation by extracting the root (taking the square root of both sides). Give exact solutions.

3. $20 = 4x^2 + 4$

$16 = 4x^2$

$4 = x^2$

$\pm 2 = x$

4. $4(x^2 + 7) - 9 = 39$

$4(x^2 + 7) = 48$

$x^2 + 7 = 12$

$x^2 = 5$

$x = \pm\sqrt{5}$

Section 5.3 - Factor completely.

5. $2x^2y^2z + 14x^3y$

$2x^2y(yz + 7x)$

6. $x^2 - 10x - 24$

$(x-12)(x+2)$

7. $12x^2 - 3x - 9$

$3(4x^2 - x - 3)$

$3(4x^2 - 4x + 3x - 3)$

$3(4x(x-1) + 3(x-1)) \nearrow$

$3(4x+3)(x-1)$

8. $6x^2 + 20x - 16$

$2(3x^2 + 10x - 8)$

$2(3x^2 + 12x - 2x - 8)$

$3x(x+4) - 2(x+4) \nearrow$

$2(3x-2)(x+4)$

9. $x^2 - 25$

$(x+5)(x-5)$

10. $x^2 - 6x + 9$

$(x-3)^2$

Section 5.5 - Solve each using the quadratic formula. Give exact solutions.

11. $x^2 + 7x + 9 = 0$

$$x = \frac{-7 \pm \sqrt{49 - 4(1)(9)}}{2}$$

$$x = \frac{-7 \pm \sqrt{13}}{2}$$

12. $x^2 + 2x - 4 = 6$

$$x^2 + 2x - 10 = 0$$

$$x = \frac{-2 \pm \sqrt{4 - 4(1)(-10)}}{2}$$

$$x = \frac{-2 \pm \sqrt{18}}{2} = \frac{-2 \pm 3\sqrt{2}}{2}$$

Section 5.6 - Perform the indicated operation.

13. $(2 + 5i)(-9 + 2i)$

$$-18 + 4i - 45i + 10i^2 = -10$$

$$-28 - 41i$$

14. $(8 - i) - (3 + 6i)$

$$8 - i - 3 - 6i$$

$$5 - 7i$$

15. $\frac{(2+i)}{(1-i)} \cdot \frac{(1+i)}{(1+i)} = \frac{2+2i+i-1}{1-i^2+1}$

$$\frac{1+3i}{2}$$

17. $(11 + 3i) + (-19 - 7i)$

$$-8 - 4i$$

Section 5.7 - Graph. Clearly mark vertex, x-intercepts, y-intercept and its reflection.

18. $f(x) = -(x+2)^2 + 6$

AOS = $x = -2$

Vertex = $(-2, 6)$

DOWN

$y = -(0+2)^2 + 6$

$$-4 + 6 = 2 \quad (0, 2)$$

$0 = -(x+2)^2 + 6$

$-6 = -(x+2)^2$

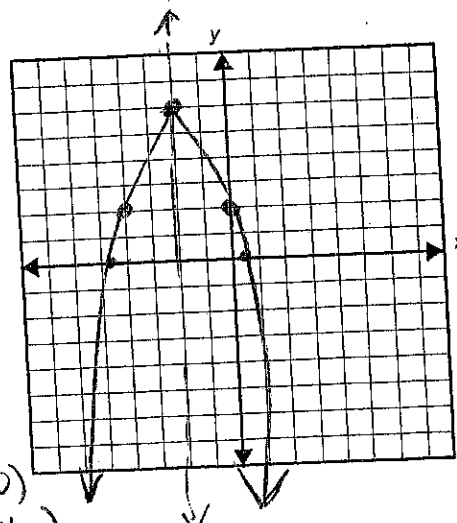
$$-2 \pm \sqrt{6}$$

$6 = (x+2)^2$

$\pm \sqrt{6} = x+2$

$-2 + \sqrt{6} = (2.4, 0)$

$-2 - \sqrt{6} = (-4.4, 0)$



19. $f(x) = 2x^2 + 4x - 6$

Axis: $= \frac{-4}{4} = -1$ $x = \frac{-b}{2a}$

Vertex: $(-1, -8)$

y int: $(0, -6)$

$2x^2 + 4x - 6 = 0$ $\frac{-4}{4} = -1$

$(2x^2 - 2x)(6x - 6) = 0$

$2x(x-1) + 6(x-1) = 0$

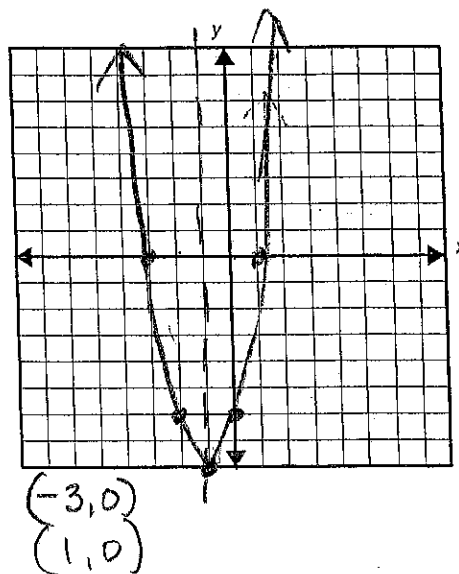
$(2x+6)(x-1) = 0$

$2x+6=0$

$x = -3$

$x-1=0$

$x = 1$

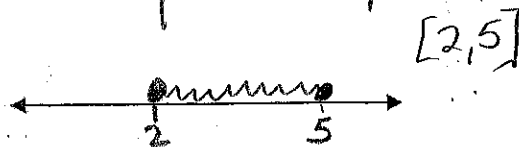


Section 5.8 - Solve each inequality. Graph the solution on a number line.

20. $x^2 - 7x + 10 \leq 0$

$(x-5)(x-2) \leq 0$

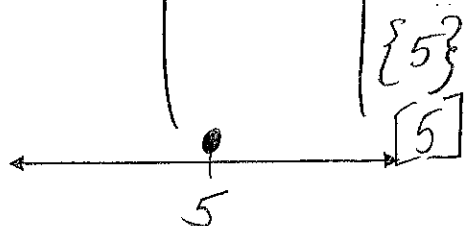
	$(x-5)(x-2)$		
0	-	-	+
3	-	+	-
10	+	+	+



22. $x^2 - 10x + 25 \leq 0$ (-)

$(x-5)(x-5) \leq 0$

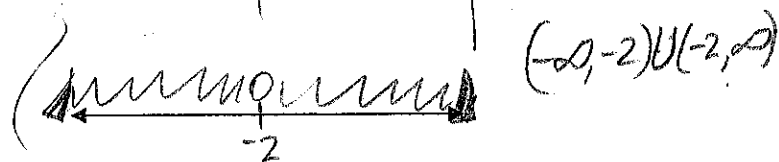
	$(x-5)(x-5)$		
0	-	-	+
10	+	+	+



21. $x^2 + 4x + 4 > 0$

$(x+2)(x+2) > 0$

	$(x+2)(x+2)$		
-5	-	-	+
0	+	+	+



23. $3x^2 - 5x - 2 \geq 0$ +

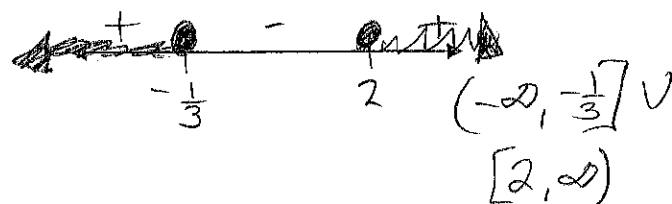
$(3x^2 - 6x + 1)(x-2) \geq 0$

$3x(x-2) + 1(x-2) = 0$

$3x+1=0$ $x-2=0$

$x = -\frac{1}{3}$ $x = 2$

	$(3x+1)(x-2)$		
-1	-	-	+
0	+	-	-
5	+	+	+



Section 5.8b - Graph each inequality.

24. $y \leq x^2 + 2x + 1$

AOS: $-\frac{-2}{2} = 1$

vertex: $(-1, 0)$

Dir: UP

y int: $(0, 1)$

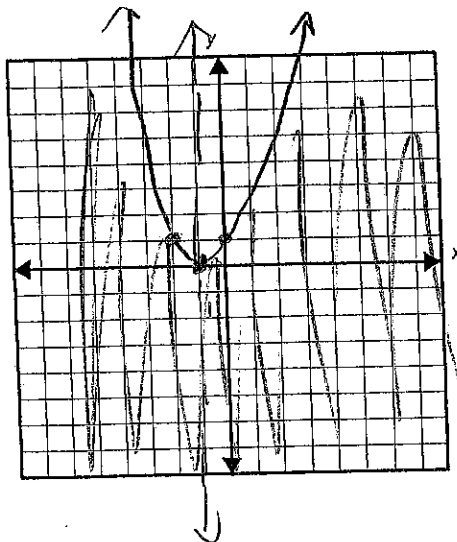
x int: $(-1, 0)$

$$x^2 + 2x + 1 = 0$$

$$(x+1)(x+1) = 0$$

$$x+1 = 0$$

$$x = -1$$



25. $y > -(x+1)^2 + 4$

AOS: -1

vertex: $-1, 4$

Down

y int: $-(0+1)^2 + 4$

$-1 + 4 = 3$ $(0, 3)$

$$0 > -(x+1)^2 + 4$$

$$-4 > -(x+1)^2$$

$$4 < (x+1)^2$$

$$\pm 2 < x+1$$

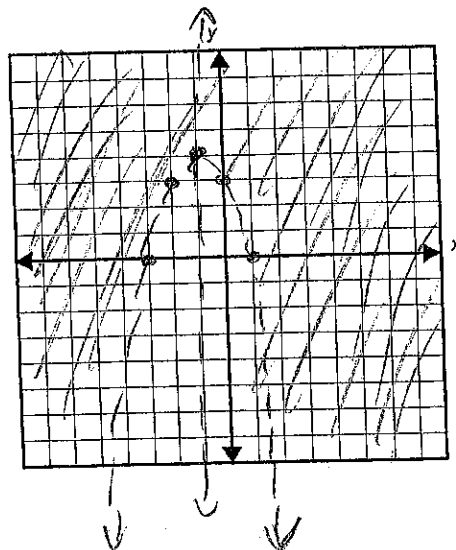
$$-1 < x$$

$$x > 1$$

$$x > -3$$

$$(-3, 0)$$

$$(1, 0)$$



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Yes or No _____

Yes or No _____

Std. Form _____

Std. Form _____

Section 5.2 - Solve each equation by extracting the root (taking the square root of both sides). Give exact solutions.

3. $20 = 4x^2 + 4$

4. $4(x^2 + 7) - 9 = 39$

Section 5.3 - Solve each equation by factoring.

5. $x^2 - 10x - 24 = 0$

$(x-12)(x+2) = 0$

$x-12=0$

$x+2=0$

$x=12$

$x=-2$

6. $12x^2 - 3x - 9 = 0$

$3(4x^2 - x - 3) = 0$

$(4x^2 - 4x) + (3x - 3) = 0$

$4x(x-1) + 3(x-1) = 0$

$3(x-1)(4x+3) = 0$

$x-1=0$

$x=1$

$4x+3=0$

$4x=-3$

$x=-\frac{3}{4}$

7. $6x^2 + 20x - 16 = 0$

$2(3x^2 + 10x - 8) = 0$

$(3x^2 + 12x) - 2(x+4) = 0$

$3x(x+4) - 2(x+4) = 0$

$(3x-2)(x+4) = 0$

$3x-2=0$

$x+4=0$

$x=\frac{2}{3}$

$x=-4$

8. $x^2 - 25 = 0$

$(x-5)(x+5) = 0$

$x-5=0$

$x+5=0$

$x=5$

$x=-5$

Cumulative Questions:

- 1) If $f(x) = 4x + 2$ and $g(x) = -3x^2$ then $f \circ g(-2)$ equals _____.

$$\begin{aligned} f \circ g(x) &= 4(-3x^2) + 2 \\ &= 4(-3(-2)^2) + 2 \\ &= 4(-12) + 2 = \boxed{-46} \end{aligned}$$

- 2) Find the equation of the line through the points $(-6, 7)$ and $(-5, 3)$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = m = \frac{3 - 7}{-5 - (-6)} = \frac{-4}{1} = -4$$

$$\begin{aligned} y - y_1 &= m(x - x_1) \\ y - 3 &= -4(x - (-5)) \\ y - 3 &= -4x - 20 \\ +3 & \quad +3 \\ \hline y &= -4x - 17 \end{aligned}$$

- 3) Solve the following inequality. Write your answer in interval notation then graph the solution on the number line provided.

$$|3x - 6| \geq 12$$

$$3x - 6 \geq 12$$

$$3x \geq 18$$

$$x \geq 6$$

$$3x - 6 \leq -12$$

$$3x \leq -6$$

$$x \leq -2$$



Interval notation:

$$\underline{(-\infty, -2] \cup [6, \infty)}$$

- 4) Solve the following equation for x .

$$\begin{array}{r} ax + b = cx + d \\ -cx \quad -cx \\ \hline ax - cx + b = d \\ \quad -b \quad -b \\ \hline ax - cx = d - b \\ x(a - c) = d - b \\ \frac{x(a - c)}{(a - c)} = \frac{d - b}{a - c} \end{array} \nearrow$$

$$\boxed{x = \frac{d - b}{a - c}}$$